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PLANS FOR
PROCUREMENT AND IMPLEMENTATION
OF AUTOMATED SYSTEMS
FOR THE
CENTRAL-WESTERN MASSACHUSETTS
REGIONAL LIBRARY SYSTEMS

May 1981

Prepared
by
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for

Central Massachusetts Regional Library System
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Plans for procurement and
implementation of automate

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J. Eugene Smith Library
Eastern Ct State Univ.
Willimantic, Conn., 06226

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PLANS FOR PROCUREMENT AND IMPLEMENTATION OF AUTOMATED SYSTEMS FOR THE CENTRAL-WESTERN MASSACHUSETTS REGIONAL LIBRARY SYSTEMS

May 1981

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by

RMG Consultants, Inc.
Central Massachusetts Regional Library System
Western Regional Public Library System

WITHDRAWN FROM
J. EUGENE SMITH LIBRARY
EASTERN CONN. STATE UNIVERSITY
WILLIMANTIC, CONN. 06226

PREFACE

In many respects, this document should be thought of as a "first-order" plan because much of the information that is required to make final, more detailed plans for various steps in the procurement, financing, installation, implementation, governance, and operation of the systems recommended for the Regions is not yet available: e.g.,

- ° Information as to which libraries can and will participate in use of the system, and on what schedule;
- ° The undecided question of whether the Regions will share a single system or each have a single system;
- ° The amount of funding available for procurement of systems;
- ° The selection of a system to be used by the libraries and information from its vendor on if, how, and at what cost it can provide various capabilities;
- ° What cost constraints the participating libraries may have in deciding on various approaches to basic implementation questions: e.g., data base establishment and maintenance, telecommunications.

Given the absence of information or decisions on certain topics, this plan therefore presents and comments on various alternatives for consideration by the Regions and makes recommendations where appropriate.

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1 SUMMARY

This report has been written by RMG Consultants, Inc. (P. O. Box 5488, Chicago, Illinois 60680) with the assistance of the Joint Automation Task Force of the Central-Western Massachusetts Library Regions. The functions of the Task Force have been to review the work of RMG Consultants and to make judgments and decisions about descriptions and questions of the objectives, plans, and requirements for multiple-library automated systems for use by the two Regions and their libraries.

The members of the Joint Automation Task Force have been as follows:

Central Region Members	
Robert Cain	Fitchburg Public Library
Margaret Brown Crist	Central Massachusetts Regional Library System
Joseph Hopkins	Worcester Public Library
Bonnie O'Brien	Shrewsbury Public Library
Kate Paranya	Worcester Public Library

Western Region Members	
Bruce Baker	Western Regional Public Library System
Polly Bentley	Palmer Public Library
Sandra Finnerty	Springfield City Library
N. Janeen Resnick	Western Regional Public Library System
Richard Starkey	Wilbraham Public Library
Robert Wagenknecht (observer)	Springfield City Library

This plan is based on the findings of a study on the feasibility and costs of an online computer system for use by the Central and Western Regions, their member libraries, and other libraries in each Region.

The organization and methodology of the study have been as follows:

- ° On-site walkthroughs by RMG Consultants of the Regional Systems and selected member libraries in each Region and their major data-handling systems for acquisitions, cataloging, circulation control, etc.
- ° The writing by RMG Consultants of requirements for automated systems for the two Regions and review of these requirements by the Central-Western Joint Automation Task Force, the Central Region Automation Committee, and the Western Region Automation Committee.
- ° The submission by RMG Consultants of a Request-for-Information to four selected vendors of automated library systems, to solicit information on the technical feasibility and costs of various sizes and configurations of systems for shared and separate uses by various combinations of libraries in both Regions.
- ° Estimates by selected libraries in each Region of the impact upon their library operations and budgets of using an automated circulation system.
- ° The receipt and interpretation by RMG Consultants of vendors' responses to the Request-for-Information and libraries' estimates.

- ° The writing by RMG Consultants of drafts of this plan on the technical feasibility and likely costs of the recommended system, and on RMG Consultants' recommendations for the proposed systems.
- ° The review, revision, and finalization of this report by the Joint Automation Task Force and RMG Consultants, Inc.

The Joint Automation Task Force recommends that the Regions examine the implied costs of the recommended system, and if they are found to be in the range of acceptability, to proceed with a formal procurement (Request-for-Proposals, or RFP) process, evaluation of proposals, selection of one or more vendors, negotiation of the most favorable terms and conditions, and award of a contract for acquisition and implementation of the system. Until negotiations are undertaken, it will not be possible to know exactly what systems and services can be obtained, and at exactly what costs.

The Joint Automation Task Force recommends that both Regions share the use of a single system, or if this proves impossible, that each Region have a single system. Both alternatives have been found to be technically and politically feasible.

The recommended system is an online, real-time library system designed around a bibliographic data base of records for various types of materials found in the collections of the Regions' libraries. The system should be capable in design, architecture, and performance capacity of supporting as many of the basic library applications (e.g., acquisitions, cataloging, circulation control, interlibrary loan, materials booking, serials check-in) as libraries within the Regions find reasonable to implement through time.

It is recommended that the Regions obtain a high-quality bibliographic data base for use in their own bibliographic data conversion. The data base would be mounted on the Regions' system(s), in order for libraries to match their collections to it.

The costs of purchasing a single system that will host a bibliographic data base and perform circulation control and interlibrary loan for both Regions' initially participating libraries, and for converting these libraries' bibliographic data, are expected to be in the range of $1.1 million to $1.4 million. The monthly operating costs of such a system (for hardware maintenance, telecommunications lines, and computer system management and operation) are expected to be approximately $19 thousand.

These estimates are based on quotations of systems from commercial vendors, as analyzed in Sections 2.3.2 and 3 of this plan.

The Joint Automation Task Force recognizes that two not-for-profit library organizations, NELINET and OCLC, Inc., may offer automated systems and services of the nature recommended by this plan. It is recommended that the two Regions' investigate these alternatives as they become available.

It is recognized that the cost and political feasibility of a project of this magnitude must be viewed within the context of Proposition 2-1/2. The Joint Automation Task Force believes that the use of automated systems will assist the two Regions' libraries to achieve increased accountability and control of costs, and that much better aggregate use of the library resources of many small Massachusetts communities will be possible. It is believed that the two Regions' shared use of automated systems will improve the services of independent public libraries in half the state, and that this is exactly the kind of innovative action and cooperation that legislative leaders have been suggesting for libraries.

2 THE RECOMMENDED SYSTEMS

This section presents the recommended approach to library automation for the two Regions, the type of system that is recommended, and the technical feasibility and costs of such a system.

The approach to automation and the recommended type of system are based upon RMG Consultants' survey of the Regional Systems and selected libraries within each Region.

Findings on the technical feasibility and costs of the proposed system are based upon analysis of vendors' responses to a Request-for-Information about various sizes and configurations of systems for shared and separate uses by various combinations of libraries in the Central and Western Regions.

2.1 The Recommended Type of System

The purpose of this section is to explain why the type of system described in the Requirements Report is recommended for the Regions' use.

The recommended system is an online, real-time library system that is designed around a bibliographic data base of MARC records for various types of materials (e.g., monographs, serials, audiovisual media) found in the collections of libraries of the Regions, and that is capable in design, architecture, and performance capacity of supporting as many basic library data-handling and record-keeping activities of the two Regional Systems and selected libraries within each Region (e.g., acquisitions, cataloging, circulation control, interlibrary loan, materials booking, serials check-in) as they find reasonable to implement through time.

The system should have excellent growth potential with respect to addition of functions (subsystems), increase of processing power and capabilities for transaction throughputs, addition of new libraries to the system, addition of online data storage, and added numbers of terminals.

The subsystems recommended for implementation as they become available are:

- Bibliographic Data Base System
- Catalog Inquiry System
- Circulation System
- Interlibrary Loan System
- AV Materials and Equipment Booking System

- System for Services to the Blind and Physically Handicapped
- Information and Referral System
- Acquisitions System
- Cataloging System
- Serials Control System.

Section 3.4 briefly describes the intended uses of these subsystems in the recommended systems.

Not all of these subsystems are available today in any one of the "turnkey" minicomputer systems whose vendors responded to RMG Consultants' Request-for-Information. However, it is prudent to anticipate that eventually they may be, and to take as long-range view as sensible in anticipating the Regions' use of them.

The kind of system that is recommended is by nature an "integrated system" whose design takes into account the basic interrelationships of the data and processing functions found in library subsystems for acquisitions, cataloging, serials control, circulation control, audiovisual materials and equipment booking, services to the blind and physically handicapped, and catalog inquiry. Each of these subsystems either creates or accesses bibliographic data, and many access other kinds of data such as those for the calendar, schedules, patrons, etc.

Once a substantial computer system and terminal network is established for any one of the basic library subsystems, it becomes desirable to have such a system capable of expansion both in functional capability (more subsystems) and data processing capacity (more terminals, data storage, processing power). The alternative pattern of growth for obtaining automated systems is for a library to use different computer systems for different library subsystems: e.g., separate systems for acquisitions, cataloging, circulation control, public access catalogs.

At this point in the Regions' planning, it is sensible to plan for systems of an "integrated" nature, since this is the developmental path being taken by the leading vendors of turnkey systems. The minicomputer technology upon which these systems are based seems also to be developing with architectural and cost/performance trends that promise affordable integrated systems that will be able to support several hundred terminals within the time frame of the Regions' ability to acquire and implement such systems.

These beliefs form the rationale for planning and seeking such systems as the Regions' recommended approach to library automation.

2.2 Alternative Sizes and Configurations of Systems

This study has addressed the feasibility and costs of the alternative sizes and configurations of systems listed below for providing the recommended type of system described in Section 2.1.

- One automated system for use by both Regions;
- Separate, single systems for each Region;
- Multiple systems for each Region;
- Successive stages of having initially one and subsequently two or more systems.

2.3 Evaluations of Alternatives

The purposes of this section are to evaluate the alternatives defined in Section 2.2 for provision of systems for the Regions, with respect to:

- ° Technical feasibility
- ° Cost
- ° Political feasibility;

and to recommend an approach to providing automated systems for the Regions.

Table 2.3-1 summarizes the evaluations of alternatives.

2.3.1 TECHNICAL FEASIBILITY

Each of the alternative system sizes is believed to be technically feasible. Section 3.1 of this report tabulates vendors' quotations for systems that range in size from 7 terminals to 261 terminals. Although interactive, library, minicomputer-based systems of this nature have not yet been implemented with as many terminals as quoted in the larger configurations, the vendors who have proposed these systems claim to have capabilities to support them.

RMG Consultants believes that it is technically feasible for the Regions to plan for a single system as large as the one that would be required to support the initially participating libraries of both Regions. Such a system (see Table 3.1-1, Lines 6 through 6.5) might have 56 to 123 terminals, based on the various quotations received.

It appears that systems of these sizes could still be made larger (as shown by Table 3.1-1, Lines 1 through 1.5, and Line 2 through 2.5) in order to accommodate growth. In the worst case, additional systems could be implemented to provide increased capacity. It would be technically feasible for the Regions to share a single system initially, and to acquire additional systems as needed. Issues of system capacity and the point of system saturation should be made topics of investigation and negotiation during the Regions' procurement process.

2.3.2 COST

This section summarizes findings on the costs of systems of alternative sizes and configurations.

Table 2.3-1 presents summaries of data that have been developed in other sections of this report. The notes to Table 2.3-1 explain where these source data may be found.

Table 2.3-1 shows rough estimates of one-time costs for buying systems and converting the bibliographic data of the libraries that would use them; and the ongoing monthly costs for system hardware maintenance, telecommunications, and operational staff. Both one-time and ongoing costs are pro-rated per user terminal (Lines 4 and 12) to allow comparisons among the various alternatives.

The pro-rated costs per terminal in Line 4 show that it would be to the Regions' advantage to buy a single system for use by their initial libraries (Col. 4), rather than for each Region to buy a separate system for its initial libraries (Cols. 2 and 3).

Line 4 shows that the purchase of separate systems for the three Central Region clusters (Cols. 5, 6, and 7) would not be as advantageous as the purchase of a single system for the Central Region (Col. 2).

Similar conclusions are reached on the basis of comparing ongoing monthly costs pro-rated per user terminal (Line

12): the costs of operating separate clusters (Cols. 5, 6, and 7) are very high compared to the costs of operating a single system for the Central Region (Col. 2), and the costs of operating a single system for initial libraries in both Regions (Col. 4) is less than the combined costs of operating a separate system for each Region (Cols. 2 and 3).

From these comparisons it is recommended on the basis of both one-time and ongoing costs that the two Regions share a single system; or if this proves to be impossible, that the Regions should implement a single system each. On the basis of cost, the case for having three separate clusters in the Central Region instead of one shared system cannot be justified.

TABLE 2.3-1 SUMMARY OF ROUGH COST ESTIMATES FOR ALTERNATIVE SYSTEM SIZES AND CONFIGURATIONS PLUS RETROSPECTIVE FULL RECORD BIBLIOGRAPHIC DATA CONVERSION, FOR INITIALLY PARTICIPATING LIBRARIES (Page 1 of 3)

1	2 Single System for Initial Libraries in Central Region	3 Single System for Initial Libraries in Western Region	4 Single System for Initial Libraries in Both Regions	5 Single System for Initial Libraries in Fitchburg Cluster	6 Single System for Initial Libraries in Shrewsbury Cluster	7 Single System for Initial Libraries in Worcester Cluster
One-Time Costs	($000)	($000)	($000)	($000)	($000)	($000)
1 System purchase price	330.5-533.4	465.7-763.3	711.5-1,043.8	180.5-248.1	188.3-262.5	184.7-275
2 Nos. of online user terminals	20-45	40-68	66-123	9-7	7-15	7-16
3 Bibliographic data base conversion (full-records)	141	189	298	47	24	65
4 Pro-rated cost per online	23.6-15	16.4-14	15.3-10.9	25.4-42.3	30.3-19.1	35.7-21.3
Ongoing Monthly Costs	($)	($)	($)	($)	($)	($)
5 System maintenance	2,610-NQ	3,103-NQ	8,298-NQ	NQ-1,669	1,468-NQ	1,468-NQ
6 System maintenance pro-rated per user terminal	131	78	126	238	210	210
7 Telecommunications charges	1,122	1,502	4,292	183	263	169
8 Nos. of lines/$ per line	8/$140	10/$150	18/$238	3/$61	4/$66	6/$29
9 Line charges per terminal for 3 terminals per line	47	50	79	20	22	10
10 Salaries of operators	6,417	6,417	6,417	3,358	3,358	3,358
11 Salaries pro-rated per terminal	321-143	161-95	97-52	373-480	480-224	480-210
12 Total costs pro-rated per online user terminal: Totals of Lines 6, 9, 11	499-321	289-223	302-257	631-738	712-456	700-439
13 Total monthly costs: Totals of Lines 5, 7, and 10	10,149	11,022	19,007	5,210	5,089	4,995

TABLE 2.3-1 SUMMARY OF ROUGH COST ESTIMATES FOR ALTERNATIVE SYSTEM SIZES AND CONFIGURATIONS PLUS RETROSPECTIVE FULL RECORD BIBLIOGRAPHIC DATA CONVERSION, FOR INITIALLY PARTICIPATING LIBRARIES (Page 2 of 3)

Notes for Table 2.3-1

(a) Lines 1 and 2, Cols. 2 through 7: The high and low quotations for each size of system shown in Cosl. 2 through 7, and the number of user terminals for each quotation, are taken from Table 3.1-1.

(b) Line 3, Col. 2: Table 4.3-2.
Line 3, Col. 3: Table 4.3-3.
Line 3, Col. 4: Table 4.3-1.
Line 3, Col. 5: Table 4.3-4.
Line 3, Col. 6: Table 4.3-5.
Line 3, Col. 7: Table 4.3-6.

(c) Line 4, Cols. 2 through 7: The sum of Lines 1 and 3 divided by Line 2.

(d) Lines 5 and 6, Cols. 2 through 7: For the same systems quoted in Lines 1 and 2, monthly maintenance charges are taken from Table 3.1-4.

(e) Lines 7 and 8, Col. 2: Table 3.2-1, Line 10, Col. 7.

(f) Lines 7 and 8, Col. 3: Table 3.2-1, Line 22, Col. 6.

(g) Lines 7 and 8, Col. 4: Table 3.2-1, Line 23, Col. 6.

(h) Lines 7 and 8, Col. 5: Table 3.2-2, Line 5, Col. 6.

(i) Lines 7 and 8, Col. 6: Table 3.2-1, Line 11, Col. 6.

(j) Lines 7 and 8, Col. 7: Table 3.2-1, Line 14, Col. 6.

TABLE 2.3-1 SUMMARY OF ROUGH COST ESTIMATES FOR ALTERNATIVE SYSTEM SIZES AND CONFIGURATIONS PLUS RETROSPECTIVE FULL RECORD BIBLIOGRAPHIC DATA CONVERSION, FOR INITIALLY PARTICIPATING LIBRARIES (Page 3 of 3)

Notes for Table 2.3-1 (con't)

(k) Line 9; Dollar cost in Line 8 divided by 3; it assumed that it would in general be possible to configure 3 terminals per leased line.

(l) Line 10, Cols. 2, 3, and 4: Table 3.3-1, Line 8, Col. 2.

(m) Line 10, Cols. 5, 6, 7: Table 3.3-2, Line 8, Col. 2.

(n) Line 11: The same numbers of terminals are used as shown in Line 2.

2.3.3 POLITICAL FEASIBILITY

The political feasibility of a project to implement automated library systems in the Central and Western Regions must be viewed in the context of Proposition 2-1/2 and its impact on the Commonwealth of Massachusetts. Although such a project is a large undertaking, the resulting automated library systems will address two of the greatest demands growing out of the climate created by Proposition 2-1/2: increased accountability, and the need to control costs. Libraries must place emphasis on goals that will respond to more limited public funding, such as:

- Sharing rather than duplicating resources;
- Assigning personnel to tasks directly offering services to the public, rather than to routine and repetitive chores; and
- Stabilizing operational costs.

Libraries participating in an automated system will be able to track loaned and overdue materials more effectively, to provide requested materials to borrowers with greater efficiency and less staff effort, and to locate materials available in other library collections and obtain them through interlibrary loan. These improvements will substantially increase public access to the library collections of the Regions, and permit much better aggregate use of resources that the many small Massachusetts communities allocate to their libraries.

The proposed automated library systems will maintain library services in a cost effective manner. The Regions' automated systems would be a direct answer to State Government's search for broader cooperation as a way to insure efficient and maximum use of tax dollars spent by the State, cities, and towns. By sharing in automated systems, the two Regions will improve the services of independent public libraries in half the State. This is exactly the kind of innovative action that State legislative leaders have been suggesting for libraries.

The Central and Western public library regions now face an issue that will determine whether their libraries will remain isolated and struggle independently to maintain their collections and services within the constraints of tightening budgets, or join together in the sharing of new technologies that will enable greater resource sharing among all libraries and more cost effective operations within each. Data gathered and presented in this study clearly indicate that cooperative action by the communities of the Regions is the appropriate choice.

That the two Regions have worked together to administer and conduct this study is evidence of the political feasibility of their sharing in the acquisition and operation of automated systems. The levels of close communication and collaboration by the Regional Administrators and staffs, the Joint Automation Task Force of librarians from both Regions, and each Region's Automation Committee (of librarians actively planning for automated systems) have created excellent working relationships. The resulting attitude is a determined optimism that shared use of automated systems is the best way for the many small public libraries in Central and Western Massachusetts to survive and continue pursuit of their public service goals.

2.4 The Recommended Alternatives and Objectives for Implementation

This section states objectives for the Regions' implementation of automated library systems, and a prioritized list of alternatives for reaching them.

2.4.1 OBJECTIVES FOR IMPLEMENTATION

(1) To share the largest reasonable data base of library holdings among the greatest reasonable number of libraries.

(2) To provide for every library in the Regions an opportunity to represent its holdings in the data base and to have access to the system via either an online terminal or a telephone call to an operator of an online terminal for purposes of interlibrary loan, audiovisual materials and equipment booking, and services to the blind and physically handicapped.

2.5 Implementation of Subsystems

The purpose of this section is to recommend goals for implementation of each major subsystem in

- Each of the Regional Systems
- Both Regions' libraries.

2.5.1 BIBLIOGRAPHIC DATA BASE SYSTEM

This system is recommended to contain an online data base of MARC records for materials found in the collections of libraries in the Regions: books, serials, films, microfilms, microfiche, records, audiotapes, etc. The system would provide interactive capabilities for input, update, and query of these records. An extensive set of queries by various bibliographic data items is recommended. Batch processing capabilities would be provided to add MARC records from external sources, and to enable libraries to output variously-specified sets of machine-readable records and printed products: e.g., printed lists of headings, new acquisitions lists, magnetic tape files of records for production of COM catalogs.

This system should be capable of being expanded to provide capabilities required for an Authority Control System, Online Catalog System, and Serials Control System.

This system is intended to be the basis for cooperative acquisitions programs and extensive interlibrary loan practices among each Region's libraries.

Use of the Bibliographic Data Base System will be restricted to libraries that are allowed to create and update bibliographic records.

2.5.2 CATALOG INQUIRY SYSTEM

This system is intended to consist of a set of user-oriented query functions for search and retrieval of records contained in the Bibliographic Data Base System.

The Catalog Inquiry System is intended to complement - not to replace - existing catalogs in the Regions' libraries, and in particular to support their shared access to bibliographic data in support of acquisitions, cataloging, and interlibrary loan. This system is intended to serve as an "online catalog" for the two Regions' collections, allowing them to replace their current card catalogs.

The Catalog Inquiry System is intended for use initially by library staff and not directly by library patrons.

Each library using the system will be allowed to use the Catalog Inquiry System. For the two Regions' Systems, this system will provide access to the Regional collections and serve with the Bibliographic Data Base System as an online catalog for the Regional collections.

2.5.3 CIRCULATION SYSTEM

This system is recommended to have capabilities to control circulation of all materials loaned by the libraries, including items that will not have machine-readable identification, and to have a patron accounting system that will record patrons' relationships with the library and produce appropriate statements and notices. The capabilities of the Circulation System would be used to record charges for services rendered by the libraries to patrons (e.g., charges for photocopying, rental of equipment), to notify patrons of available materials returned from circulation or newly received, and to handle certain functions of the Materials Booking System and Interlibrary Loan System.

The system should allow willing patrons to charge and renew items for themselves. It should provide the option for a Course Reserve System that will produce lists of items last used or wanted for a given course, as well as lists of items placed on reserve, for use by patrons. The system must have capabilities for variable loan periods that accommodate various libraries' schedules; for "save", recall, and trapping of circulating items wanted by patrons; for inter-active messages and notices for patrons; for transaction blocks of delinquent patrons; and for appropriate batch produced notices. The system should produce a variety of reports on library and collection use, and users' characteristics.

Each library using the system will be allowed to use the Circulation System.

2.5.4 INTERLIBRARY LOAN SYSTEM

The capabilities recommended for this system include online transmission of interlibrary loan requests and other kinds of messages among libraries using the system and the logging of such transmissions on optional printers in libraries. Various capabilities of the circulation system will be used to place "saves" on wanted items, "trap" them for interlibrary loan, etc. The system should record and produce printed requests for items to be borrowed from libraries outside of the Regions.

Each library using the system will be allowed to use the Interlibrary Loan System.

2.5.5 AV MATERIALS AND EQUIPMENT BOOKING SYSTEM

This system is intended to support extensive booking and loan of audiovisual hardware and software by the two Regional Systems to their member libraries and end users, and perhaps in the future by libraries to their patrons.

In addition to the functions of the Circulation System and Interlibrary Loan System, the Materials Booking System should have capabilities to determine possible booking dates for requested audiovisual hardware and software; to identify materials and match them to users' profiles according to subject, intended audience (children, young adults, adults), type (e.g., 16mm or 8mm); to maintain records of users' previous bookings and avoid unwanted repetitive bookings; to record advance bookings; to cancel or change bookings; to produce lists for gathering and preparation of pieces to be loaned; to note when equipment or films are damaged and are not available for use pending repair; and to schedule equipment for preventive maintenance. The scheduling functions of the system must take into account the Regions' current delivery systems, delivery by U.S. mail, and requests for multiple, possible booking dates.

This system is recommended for initial implementation by the Western Region, and then by the Central Region.

2.5.6 SYSTEM FOR SERVICES FOR THE BLIND AND PHYSICALLY HANDICAPPED

This system is intended to support the automatic selection and loan of "talking books" to blind and physically handicapped patrons.

In addition to the functions of the Circulation System, Interlibrary Loan System, and Materials Booking System, this system should have capabilities for storing users' profiles, automatically matching profiles to attributes of available materials, selecting materials for loan to users that they have not received before, producing lists for gathering and preparation of records to be loaned, and permanently recording which titles have been loaned to each user.

This system is intended for use only by the Regional Systems.

2.5.7 INFORMATION AND REFERRAL SYSTEM

The objectives of the Information and Referral System are:

- ° To provide for machine storage of relatively small quantities of frequently used reference information, and to provide for remote access to this information via CRT/keyboard terminals.
- ° To provide for storage and remote access via CRT/keyboard terminals to information on human service programs in order to refer people in need of such services to appropriate agencies in a timely fashion.

The Reference Information Facility is intended to support Region-wide, local-library, and personal files of free-text, formatted, reference information that will be input and updated via CRT/keyboard terminals by the Regions' and libraries' staffs. It is intended that staffs may create files of reference information considered of Region-wide interest (e.g., schedules of community events, library programs, adult education courses, etc.; and highly-structured lists or classifications of sources of topical information) as well as quick-reference files of a personal nature for use by individual libraries' staff.

Such files will be accessible only by File Identifier, and a directory giving the Names and Identifiers of Files will be maintained by the system.

The system will provide for on-demand printout of these files, with the output to be formatted in the same way that data have been input.

The Referral Information Facility is intended to store and provide Boolean key-word access to names, descriptions, and descriptions of services of individuals, agencies, and organizations that provide human services. The following types of information about each agency will be stored and indexed:

- Name
- Location
- Area of service
- Subject terms describing services
- Narrative overview of organization
- Narrative descriptions of services

This information will be input and updated via CRT/keyboard terminals by designated staff, and will be accessible by CRT/keyboard terminals by the Regions' and libraries' staffs.

2.5.8 ACQUISITIONS SYSTEM

This system is recommended to have interactive capabilities for ordering, accessioning, invoice processing, and fund control. It should produce selection lists of titles to be reviewed for ordering decisions and automatically provide claims and cancellation notices. It should be able to produce "rush orders" on demand. It should be able to accept batch input of machine-readable selection records provided by acquisitions vendors according to the libraries' selection profiles, to produce selection lists of these or of locally-input bibliographic (selection) records, and to record each library's decision to order an item or not. This system is intended to become the major tool by which the libraries can effect a coordinated acquisitions program.

It is recommended that the two Regional Systems implement the Acquisitions System first; then the two largest libraries, Worcester Public Library and Springfield Public Library; and then other libraries as suitable.

2.5.9 CATALOGING SYSTEM

The Cataloging System is intended primarily for use by the Regional Systems and selected libraries to produce machine-readable catalog records in the Bibliographic Data Base System for materials in their collections.

2.5.10 SERIALS CONTROL SYSTEM

The Serials Control System is intended to support Region-wide union data bases of serials, and printed or COM catalogs of these holdings, as well as online query of them.

3 ESTIMATED HOST SYSTEM COSTS

This section identifies the factors that will determine system costs, and gives estimates where possible. The following cost factors are addressed:

- One-time purchase costs of systems for circulation control.
- Telecommunications costs.
- Costs of operational staff.
- One-time system implementation costs.
- One-time costs of expansion of systems for further subsystems.

The following sections address each of these concerns.

3.1 One-Time Purchase Costs of Systems and Monthly Maintenance Costs

In order to assess the technical feasibility and costs of systems for various numbers of libraries (see Section 2.2), RMG Consultants, Inc. issued a Request-for-Information ("RFI") to four vendors of automated systems of the general nature described in Section 2.1. The RFI solicited data on the configurations and costs of systems for circulation control for the following sets of libraries:

- ° All public libraries in both Regions.
- ° Each Region's public libraries.
- ° Each Region's possible initially participating libraries.
- ° Both Regions' possible initially participating libraries.
- ° Three separate clusters of libraries in the Central Region.

It should be noted that those libraries considered to be "possible initially participating libraries" had been self-identified through several years of discussions and automation committee meetings in each Region on the possibilities for automated circulation systems, and that the definition of three potential clusters of libraries in the Central Region for purposes of sharing separate circulation systems had been made during this time.

Table 3.1-1 tabulates vendors' quotations of various system configurations. Some of the items chosen for tabulation by RMG Consultants, Inc. were not itemized in all vendors' quotations. Quotations on large systems were not received from all vendors.

Table 3.1-1 should be regarded only as a tabulation of rough estimates by vendors, based on gross requirements, of systems for circulation control. These estimates are for widely-varying hardware configurations with different numbers and kinds of terminals, different sizes and numbers of CPU's, different amounts of disk storage, and so on.

Table 3.1-2 tabulates the purchase prices and numbers of interactive user terminals (i.e., not console terminals or off-line terminals) quoted for each configuration, and divides each purchase price by its corresponding number of terminals in order to arrive at a purchase cost pro-rated by the number of terminals for each configuration.

For each vendor's series of quotations as shown in Columns 1, 2, 3, and 4 of Table 3.1-2, Figure 3.1-3 plots the coordinates of system price pro-rated by user terminals (from Lines 1.3, 2.3, 3.3, 4.3, 5.3, 6.3, 7.3, 8.3 and 9.3 of Table 3.1-2) and the number of user terminals per system (from Lines 1.2, 2.2, 3.2, 4.2, 5.2, 6.2, 7.2, 8.2, and 9.2 of Table 3.1-2).

Figure 3.1-3 therefore plots the costs of vendors' systems pro-rated according to the numbers of terminals in each system configuration. It shows the trends of system purchase costs pro-rated per terminal from small to large systems, and indicates the economies of scale in the purchase costs of medium to large systems (40 terminals and more) compared to purchase costs of smaller systems (fewer than 40 terminals).

Similarly, Table 3.1-4 tabulates vendors' monthly maintenance charges for various system configurations, and divides each monthly maintenance charge by the corresponding number of terminals in order to arrive at monthly maintenance charges pro-rated per number of terminals. Figure 3.1-5 depicts comparisons of the various systems' monthly maintenance charges pro-rated per terminal. It shows that there is also an economy of scale for monthly maintenance charges.

However, in a geographically dispersed network, the savings of buying one large system must be compared to the costs of communications between the host computer and the remote terminals. Section 3.2 considers telecommunications costs.

TABLE 3.1-1 TABULATION OF VENDORS' QUOTATIONS
(Page 1 of 3)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
1	Single system for all libraries in both Regions			Not quoted	Not quoted
1.1	Purchase price	$ 1,811,827	$ 2,912,653		
1.2	Monthly maintenance charges	17,000	19,189		
1.3	Numbers/costs of online terminals	261/$613,350	252/$997,920		
1.4	Amount of disk storage	8x300MB = 2.4G	24x240MB = 5.76G		
1.5	Cost of disk storage	Not quoted	$ 720,000		
2	Single system for all libraries in Central Region			Not quoted	
2.1	Purchase price	$ 861,998	$ 1,340,972		$ 1,211,200
2.2	Monthly maintenance charges	$ 9,273	$ 8,312		Not quoted
2.3	Numbers/costs of online terminals	111/$260,850	109/$431,640		160/$480,000
2.4	Amount of disk storage	4x300MB = 1.2G	12x240MB = 2.9G		3x675MB = 2.03G
2.5	Cost of disk storage	Not quoted	$ 381,000		$ 135,000
3	Single system for all libraries in Western Region			Not quoted	
3.1	Purchase price	$ 1,028,718	$ 1,830,216		$ 1,394,450
3.2	Monthly maintenance charge	$ 10,500	$ 12,770		Not quoted
3.3	Numbers/costs of online terminals	150/$352,500	143/$566,280		216/$648,000
3.4	Amount of disk storage	5x300MB = 1.5G	17x240MB = 4.1G		3x675MB = 2.03G
3.5	Cost of disk storage	Not quoted	$ 513,000		$ 135,000
4	Single system for initial libraries in Central Region				
4.1	Purchase price	$ 388,515	$ 330,500	$ 403,500	$ 533,450
4.2	Monthly maintenance charges	$ 2,700	$ 2,610	Not quoted	Not quoted
4.3	Numbers/costs of online terminals	26/$ 61,100	20/$ 79,200	33/$175,500	45/$135,000
4.4	Amount of disk storage	3x300MB = .9G	5x200 = 1.5G	Not quoted	2x675MB = 1.4G
4.5	Cost of disk storage	Not quoted	$ 123,000	Not quoted	$ 90,000

TABLE 3.1-1 TABULATION OF VENDORS' QUOTATIONS
(Page 2 of 3)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
5	Single system for initial libraries in Western Region				
5.1	Purchase price	$ 465,785	$ 467,130	$ 763,300	$ 716,850
5.2	Monthly maintenance charges	$ 3,103	$ 3,545	Not quoted	Not quoted
5.3	Numbers/costs of online terminals	40/$ 94,000	36/$142,560	68/$348,000	78/$234,000
5.4	Amount of disk storage	3x300MB = .9G	7x300MB = 2.1G	3x300MB+160MB=1.06G	2x675MB = 1.4G
5.5	Cost of disk storage	Not quoted	$ 161,000	Not quoted	$ 90,000
6	Single system for initial libraries in both Regions				
6.1	Purchase price	$ 711,564	$ 952,591	$ 980,300	$ 1,043,850
6.2	Monthly maintenance charges	$ 8,298	$ 6,823	Not quoted	Not quoted
6.3	Numbers/costs of online terminals	66/$167,970	56/$221,760	101/$523,500	123/$369,000
6.4	Amount of disk storage	4x300MB = 1.2G	12x300MB = 3.6G	3x300MB = 1.06G	3x675MB = 2.03G
6.5	Cost of disk storage	Not quoted	$ 339,000	Not quoted	$ 135,000
7	Single system for libraries in Fitchburg Cluster				
7.1	Purchase price	$ 248,073	$ 183,460	$ 180,500	$ 242,750
7.2	Monthly maintenance charges	$ 1,669	$ 1,441	Not quoted	Not quoted
7.3	Numbers/costs of online terminals	7/$ 20,965	6/$ 23,760	9/$ 20,055	15/$ 45,000
7.4	Amount of disk storage	2x150MB = 300MB	2x300MB = 600MB	132MB	2x160MB = 320MB
7.5	Cost of disk storage	Not quoted	$ 52,000	Not quoted	$ 30,000
8	Single system for libraries in Shrewsbury Cluster				
8.1	Purchase price	$ 241,980	$ 188,320	$ 191,000	$ 262,550
8.2	Monthly maintenance charges	$ 1,505	$ 1,468	Not quoted	Not quoted
8.3	Numbers/costs of online terminals	8/$ 23,960	7/$ 27,720	8/$ 37,000	15/$ 45,000
8.4	Amount of disk storage	2x80MB = 160MB	2x300MB = 600MB	132MB	2x160MB = 320MB
8.5	Cost of disk storage	Not quoted	$ 52,000	Not quoted	$ 30,000

TABLE 3.1-1 TABULATION OF VENDORS' QUOTATIONS
(Page 3 of 3)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
9	Single system for libraries in Worcester Cluster				
9.1	Purchase price	$ 264,825	$ 184,720	$ 275,000	$ 262,550
9.2	Monthly maintenance charges	$ 1,809	$ 1,468	Not quoted	Not quoted
9.3	Numbers/costs of online terminals	11/$ 30,745	7/$ 27,720	16/$ 98,000	15/$ 45,000
9.4	Amount of disk storage	2x300MB = 600MB	2x300MB = 600MB	510MB	2x160MB = 320MB
9.5	Cost of disk storage	Not quoted	$ 52,000	Not quoted	$ 30,000

TABLE 3.1-2 SYSTEM PURCHASE PRICES PRO-RATED PER NUMBERS OF TERMINALS
(Page 1 of 2)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
1	Single system for all libraries in both Regions				
1.1	Quoted purchase price	$1,811,827	$2,912,653	Not quoted	Not quoted
1.2	Number of online user termnals	261	252		
1.3	Price pro-rated by user terminals	$ 6,942	$ 11,588		
2	Single system for all libraries in Central Region				
2.1	Quoted purchase price	$ 861,998	$1,340,972	Not quoted	$1,211,200
2.2	Number of online user terminals	111	109		160
2.3	Price pro-rated by user terminals	$ 7,765	$ 12,302		$ 7,570
3	Single system for all libraries in Western Region				
3.1	Quoted purchase price	$1,028,718	$1,830,216	Not quoted	$1,394,450
3.2	Number of online user terminals	150	143		216
3.3	Price pro-rated by user terminals	$ 6,858	$ 12,799		$ 6,455
4	Single system for initial libraries in Central Region				
4.1	Quoted purchase price	$ 388,515	$ 300,500	$ 403,500	$ 533,450
4.2	Numbers of online user terminals	26	20	33	45
4.3	Price pro-rated by user terminals	$ 14,942	$ 16,525	$ 12,227	$ 11,854

TABLE 3.1-2 SYSTEM PURCHASE PRICES PRO-RATED PER NUMBERS OF TERMINALS
(Page 2 of 2)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
5	Single system for initial libraries in Western Region				
5.1	Quoted purchase price	$ 475,785	$ 467,130	$ 763,300	$ 716,850
5.2	Numbers of online user terminals	40	36	68	78
5.3	Price pro-rated by user terminals	$ 11,645	$ 12,976	$ 11,225	$ 9,190
6	Single system for initial libraries in both Regions				
6.1	Quoted purchase price	$ 711,564	$ 952,591	$ 980,300	$1,043,850
6.2	Numbers of online user terminals	66	56	101	123
6.3	Price pro-rated by user terminals	$ 10,781	$ 17,010	$ 9,705	$ 8,487
7	Single system for libraries in Fitchburg Cluster				
7.1	Quoted purchase price	$ 248,073	$ 183,460	$ 180,500	$ 242,750
7.2	Numbers of online user terminals	7	6	9	15
7.3	Price pro-rated by user terminals	$ 35,439	$ 30,576	$ 20,055	$ 16,183
8	Single system for libraries in Shrewsburg Cluster				
8.1	Quoted purchase price	$ 241,980	$ 188,320	$ 191,000	$ 262,550
8.2	Numbers of online user terminals	8	7	8	15
8.3	Price pro-rated by user terminals	$ 30,248	$ 26,903	$ 23,875	$ 17,503
9	Single system for libraries in Worcester Cluster				
9.1	Quoted purchase price	$ 264,825	$ 284,720	$ 275,000	$ 262,550
9.2	Numbers of online user terminals	11	7	16	15
9.3	Price pro-rated by user terminals	$ 24,075	$ 26,389	$ 17,187	$ 17,503

FIGURE 3.1-3 COMPARISONS OF PURCHASE PRICES OF SYSTEMS PRO-RATED PER NUMBERS OF TERMINALS

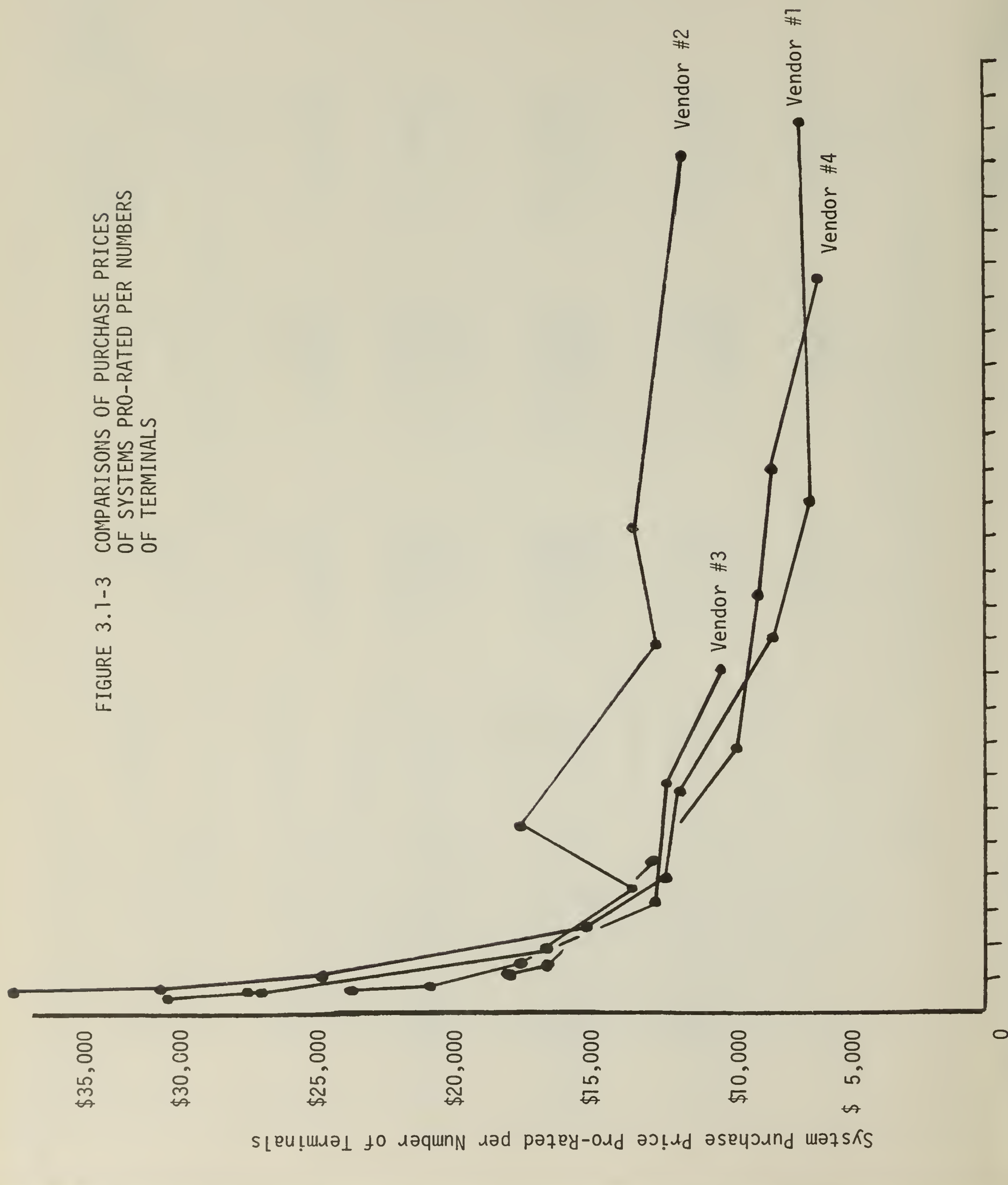


TABLE 3.1-4 MONTHLY MAINTENANCE CHARGES PRO-RATED PER NUMBERS OF TERMINALS
(Page 1 of 2)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
1	Single system for all libraries in both Regions				
1.1	Quoted monthly maintenance charges	$17,000	$19,189	Not quoted	Not quoted
1.2	Number of online user terminals	261	252		
1.3	Charges pro-rated by user terminals	$ 65.13	$ 76.15		
2	Single system for all libraries in Central Region				
2.1	Quoted monthly maintenance charges	$ 9,273	$ 8,312	Not quoted	Not quoted
2.2	Number of online user terminals	111	109		
2.3	Charges pro-rated by user terminals	$ 83.54	$ 76.26		
3	Single system for all libraries in Western Region				
3.1	Quoted monthly maintenance charges	$10,500	$12,770	Not quoted	Not quoted
3.2	Number of online user terminals	150	143		
3.3	Charges pro-rated by user terminals	$ 70.00	$ 89.30		
4	Single system for initial libraries in Central Region				
4.1	Quoted monthly maintenance charges	$ 2,700	$ 2,610	Not quoted	Not quoted
4.2	Numbers of online user terminals	26	20		
4.3	Charges pro-rated by user terminals	$ 103.85	$ 130.50		

TABLE 3.1-4 MONTHLY MAINTENANCE CHARGES PRO-RATED PER NUMBERS OF TERMINALS
(Page 2 of 2)

		1 VENDOR #1	2 VENDOR #2	3 VENDOR #3	4 VENDOR #4
5	Single system for initial libraries in Western Region				
5.1	Quoted monthly maintenance charges	$ 3,103	$ 3,545	Not quoted	Not quoted
5.2	Numbers of online user terminals	40	36		
5.3	Charges pro-rated by user terminals	$ 77.58	$ 98.47		
6	Single system for initial libraries in both Regions				
6.1	Quoted monthly maintenance charges	$ 8,298	$ 6,823	Not quoted	Not quoted
6.2	Numbers of online user terminals	66	56		
6.3	Charges pro-rated by user terminals	$ 125.73	$ 121.84		
7	Single system for libraries in Fitchburg Cluster				
7.1	Quoted monthly maintenance charges	$ 1,669	$ 1,441	Not quoted	Not quoted
7.2	Numbers of online user terminals	7	6		
7.3	Charges pro-rated by user terminals	$ 238.43	$ 240.17		
8	Single system for libraries in Shrewsbury Cluster				
8.1	Quoted monthly maintenance charges	$ 1,505	$ 1,468	Not quoted	Not quoted
8.2	Numbers of online user terminals	8	7		
8.3	Charges pro-rated by user terminals	$ 188.13	$ 209.71		
9	Single system for libraries in Worcester Cluster				
9.1	Quoted monthly maintenance charges	$ 1,809	$ 1,468	Not quoted	Not quoted
9.2	Numbers of online user terminals	11	7		
9.3	Charges pro-rated by user terminals	$ 164.45	$ 209.71		

TABLE 3.1-5 COMPARISONS OF MONTHLY MAINTENANCE CHARGES PRO-RATED PER NUMBER OF TERMINALS

(Page 1 of 2)

System Configuration

1. Single system for all libraries in both Regions

   Vendor #1 (261 Terminals)
   Vendor #2 (252 Terminals)

2. Single system for all libraries in Central Region

   Vendor #1 (111 Terminals)
   Vendor #2 (109 Terminals)

3. Single system for all libraries in Western Region

   Vendor #1 (150 Terminals)
   Vendor #2 (143 Terminals)

4. Single system for initial libraries in Central Region

   Vendor #1 (26 Terminals)
   Vendor #2 (20 Terminals)

5. Single system for initial libraries in Western Region

   Vendor #1 (40 Terminals)
   Vendor #2 (36 Terminals)

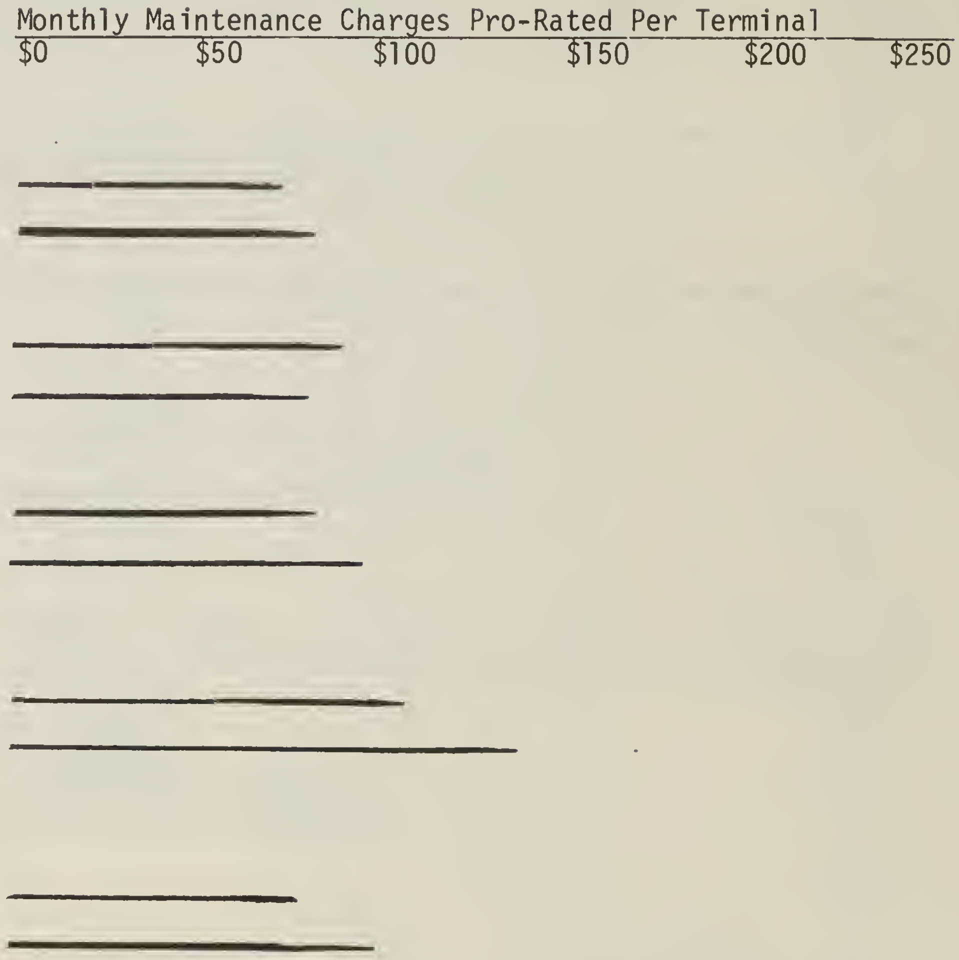


TABLE 3.1-5 COMPARISONS OF MONTHLY MAINTENANCE CHARGES PRO-RATED PER NUMBER OF TERMINALS

(Page 2 of 2)

System Configuration

6. Single system for initial libraries in both Regions

    Vendor #1 (66 Terminals)
    Vendor #2 (56 Terminals)

7. Single system for libraries in Fitchburg cluster

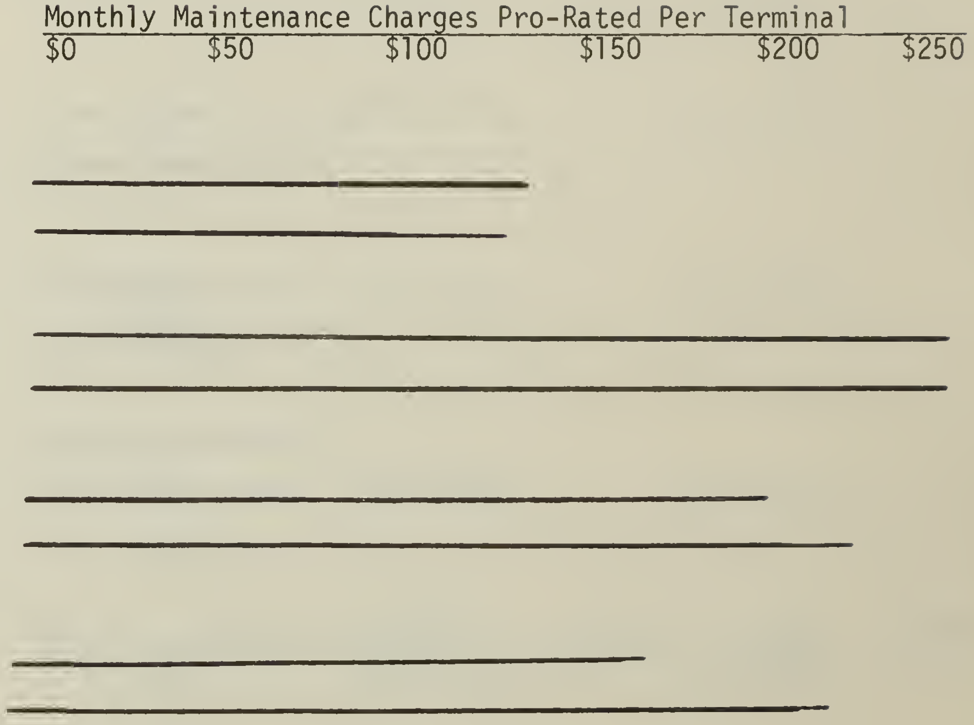
    Vendor #1 (7 Terminals)
    Vendor #2 (6 Terminals)

8. Single system for libraries in Shrewsburg cluster

    Vendor #1 (8 Terminals)
    Vendor #2 (7 Terminals)

9. Single system for libraries in Worcester cluster

    Vendor #1 (11 Terminals)
    Vendor #2 (7 Terminals)



3.2 Telecommunications Costs

In their configurations and quotations of systems, the four vendors assumed point-to-point leased telephone lines would be used for communications between terminals and computers. Each vendor indicated that should it be chosen to supply systems, that the Regions' communications requirements would be analyzed to determine more efficient configurations based on the use of multiplexors and multiple terminals on leased lines.

As the vendors indicated, the purchase of multiplexor configurations would cost more than the purchase of point-to-point modems, but the ongoing monthly costs of leased telephone lines would be less with shared lines than with point-to-point lines.

It must be noted that the Regions' costs for telecommunications equipment and leased lines will not be finally known until a specific vendor and system are selected, the libraries using the system are identified, and choices among alternative telecommunications configurations are made.

However, in order to gain some insight into the telecommunications costs implied by the provision of one, two, or more computer systems for the two Regions' use, the following estimates of costs for leased telephone lines have been made for the initially participating libraries in each Region:

° The costs of point-to-point leased lines from each initially participating library in both Regions to Hatfield and to Worcester (Table 3.2-1).

° The costs of point-to-point leased lines from each library in a Central Region cluster to the host library of its respective cluster (Table 3.2-2).

° Very rough estimates of costs for alternative communications configurations (Table 3.2-3).

TABLE 3.2-1 ROUGHLY ESTIMATED COSTS OF POINT-TO-POINT LEASED LINES FOR INITIALLY PARTICIPATING LIBRARIES IN EACH REGION BOTH TO WORCESTER AND TO HATFIELD

1 Library Location	2 Mileage to Hatfield	3 Mileage to Worcester	4 Monthly Line Charge per Mile	5 Local Hookup Charge x 2	6 Monthly Charge to Hatfield	7 Monthly Charge to Worcester
1 Central						
2 Auburn	42	6	$ 7.05	$ 38.46	$ 334.56	$ 80.76
3 Fitchburg	43	23	7.05	38.46	341.61	200.61
4 Gardner	34	24	7.05	38.46	278.16	207.66
5 Leominster	44	19	7.05	38.46	348.66	172.41
6 Northboro	50	10	7.05	38.46	390.96	108.96
7 Shrewsbury	46	5	7.05	38.46	362.76	73.71
8 Westboro	51	10	7.05	38.46	398.01	108.96
9 Worcester	42	-	7.05	38.46	334.56	169.20
10 Subtotals of Lines 2-9					$ 2,789.28	$ 1,122.27
11 Western						
12 Forbes	5	43	7.05	38.46	73.71	341.61
13 Amherst	5	38	7.05	38.46	73.71	306.36
14 Hatfield	-	42	7.05	38.46	-	334.56
15 Palmer	21	28	7.05	38.46	186.51	235.86
16 Pittsfield	42	76	7.05	38.46	334.56	574.26
17 So. Hadley (Holyoke)	13	42	7.05	38.46	130.11	334.56
18 Springfield	19	42	7.05	38.46	172.41	334.56
19 West Springfield	19	42	7.05	38.46	172.41	334.56
20 Westfield	20	50	7.05	38.46	179.46	390.96
21 Wilbraham	20	34	7.05	38.46	179.46	278.16
22 Subtotals of Lines 12-21					$ 1,502.34	$ 3,465.45
23 Totals of lines 10 and 22					$ 4,291.62	$ 4,587.72

Notes

(a) Line 9, Col. 7: Worcester Public Library has 6 branch libraries outside of Main Library. It is assumed 6 lines @ $28.20/mo. are required to connect these to a computer assumed to be located in the Main Library.

TABLE 3.2-2 ROUGHLY ESTIMATED COSTS OF POINT-TO-POINT LEASED LINES FOR INITIALLY PARTICIPATING CENTRAL REGION LIBRARIES BOTH TO WORCESTER AND TO SITES OF CLUSTER HOSTS

1 Library Location	2 Mileage to Cluster Host	3 Mileage to Worcester	4 Monthly Line Charge per Mile	5 Local Hookup Chargex2	6 Monthly Charge to ter Host	7 Monthly Charge to Worcester
1 Fitchburg Cluster						
2 Fitchburg	-	23	$ 7.05	$ 38.46	-	$ 200.61
3 Gardner	10	24	7.05	38.46	$ 108.96	207.66
4 Leominster	5	19	7.05	38.46	73.71	172.41
5 SUBTOTALS					$ 182.67	$ 580.68
6 Shrewsbury Cluster						
7 Auburn	10	6	7.05	38.46	108.96	80.76
8 Northboro	5	10	7.05	38.46	73.71	108.96
9 Shrewsbury	-	5	-	-	-	73.71
10 Westboro	5	10	-	-	80.76	108.96
11 Subtotals of Lines 7-9					263.43	372.39
12 Totals of Lines 5 and 11					446.10	953.07
13 Worcester Cluster						
14 6 library locations outside of Main Library			28.20		169.20	169.20 [(a)]

Notes

(a) Line 14, Cols. 4 and 7: 6 lines @$28.20/mo. are assumed for connection of branch libraries to a computer assumed to be located in Main Library.

TABLE 3.2-3 ROUGHLY ESTIMATED DIFFERENCES IN COSTS OF POINT-TO-POINT LEASED LINES AMONG ALTERNATIVE SYSTEM CONFIGURATIONS FOR INITIALLY PARTICIPATING LIBRARIES

	1 Set of Libraries/ System Configurations	2 Monthly Leased-Line Charges	3 Source of Data for Monthly Leased-Line Charges
1	Single system for initial libraries in both Regions	$4,292	Table 3.2-1, Line 23, Cols. 6 and 7
2	Single system for initial libraries in Western Region	1,502	Table 3.2-1, Line 22, Col. 6
3	Single system for initial libraries in Central Region	1,122	Table 3.2-1, Line 10, Col. 7
4	Total costs for separate systems	2,624	Line 2 plus Line 3
5	Added costs for single system for both Regions	1,668	Line 1 minus Line 4
6	Total costs for separate clusters in Central Region	446	Table 3.2-2, Line 12, Col. 6
7	Added costs for single system in Central Region	507	Table 3.2-2, Line 12, Col. 7 minus Line 12, Col. 6

3.3 Costs of Operational Staff

This section presents RMG Consultants' estimates of the numbers of staff that might be required to operate systems of the type recommended for shared use by a network of libraries.

It is often claimed that systems of the type recommended can be operated by a single library with little or no special staffing. This is not the case in shared use of a system by multiple libraries. RMG Consultants believes it is prudent for the Regions to plan for constant staffing of a given system by one operator during each hour of its interactive use by a network of libraries, in order to respond to problems and questions of system operations. In addition, a third shift might be required if batch production work cannot be performed during the hours of interactive use of the system by the libraries.

A manager is required to plan system utilization and growth, handle relationships with the system vendor and other suppliers of goods and services, supervise system operators, administer the system for its users and bring policy issues to them for decisions, and assist potential participating libraries in their evaluation of and planning for use of the system.

Table 3.3-1 summarizes RMG Consultants' estimates of staffing for system operations for a single system serving one Region or both. This estimate should be confirmed or revised with more precise estimates once a specific system is selected.

Another possible system configuration is that of clusters. For this, RMG Consultants recommends a Supervisor and Chief Operator to handle day-to-day relationships with the system vendor and other suppliers of goods and services, to supervise system operations and staff, and to alert administrators to policy issues requiring decisions. Additional operators will be required to maintain constant staffing of the system during each hour of its interactive use by cluster member libraries. It is possible that the additional operators' duties may be assigned to existing staff positions in lieu of new positions and added staffing costs.

Table 3.3-2 summarizes RMG Consultants' estimates of staffing for system operations for a cluster.

Table 3.3-1

ESTIMATES OF SYSTEMS OPERATIONS STAFFING FOR A SINGLE SYSTEM FOR A REGION OR A JOINT REGIONS' SYSTEM

	1 Title of Position	2 Monthly Salary	3 Annual Salary
1	Manager	$ 1,667	$20,000
2	Operators 104 hours/week		
3	Operator #1 (Chief)	1,333	16,000
4	Operator #2	1,167	14,000
5	Operator #3	1,167	13,500
6	SUBTOTAL	5,292	63,500
7	Optional Third-Shift Operator	1,125	13,500
8	TOTAL	$ 6,417	$77,000

TABLE 3.3-2

ESTIMATES OF SYSTEMS OPERATIONS STAFFING FOR A SINGLE CLUSTER'S SYSTEM

	1 Title of Position	2 Monthly Salary	3 Annual Salary
1	Supervisor and Chief Operator	$ 1,333	$16,000
2	Other Operators		
3	Operator #1	assigned to existing staff	
4	Operator #2 (4/5 the time)	"	"
		1,333	16,000
5	Option: New positions		
6	Operator #1	1,125	13,500
7	Operator #2 (4/5 the time)	900	10,800
8		$ 3,358	$40,300

3.4 One-Time Costs of System Expansion for Other Subsystems

Until a particular system and vendor are selected for use, precise costs of the chosen system and of its expansion will not be known.

However, it is reasonable to expect that the growth of systems for added functions will involve the addition of terminals, and that the costs of this will follow the trends shown by Figure 3.1-3.

The key to this kind of estimating is projections of the numbers of additional terminals that will be required by various subsystems. On average, one additional terminal might be required in each library for the acquisitions, cataloging, and serials control subsystems. Larger libraries might require two such additional terminals.

These estimates are very rough, and should be made a topic of particular emphasis during the procurement process.

4 ALTERNATIVES FOR BIBLIOGRAPHIC DATA CONVERSION

This section presents alternatives for bibliographic data conversion.

The recommended approach is for the Regions to share a single automated system and to install a large, high-quality data base on the system for purposes of retrospective bibliographic data conversion.

The Regions' libraries would then match their holdings against this data base. Libraries' records not found would be input to the data base via processes designed to ensure bibliographic quality. The Regions must formulate agreements and practices for this.

4.1 The Range of Alternatives for Bibliographic Data Conversion

The range of alternatives for establishing the recommended MARC data base includes a variety of approaches and methods, and the use of both commercial and not-for-profit vendors. Several of the more applicable models are outlined below:

(1) Send the libraries' shelflists, or copies of them, to a commercial vendor for conversion to machine-readable form, matching against vendor's MARC-compatible data base, elimination of duplicates, consolidation of holdings data, and production of an integrated data base. Costs may range from 25¢ to 40¢ for items that match vendor's data base to $1.75 to $2.00 for items

that do not, depending on the amount of problem solving, editing, and proofreading required of the vendor.

(2) Have the libraries search a microfiche index of a vendor's data base and input call numbers and holdings for titles found, or input full local records for titles not found. The vendor will process and produce MARC-compatible records at 25¢ per record "hit," and will charge 50¢ per record for "misses." The vendor would then process both "hits" and "misses" to merge duplicates and consolidate holdings at an additional 5¢ to 8¢ per record.

(3) For OCLC members, send the libraries' shelflists, or copies of them (either in paper or microfilm form) to OCLC for data conversion. OCLC will match against the OCLC data base and edit hits to libraries' specifications. Records not found will be input; records to be fully input must contain complete bibliographic information. The price quoted will be a "single unit price" for all records in the file, and will range from 50¢ to $1.50 depending on the hit rate expected against the data base and the extent of required editing.

This service is not now offered to non-OCLC members but might be in the future.

(4) Query OCLC online for matches with local records. Post local holdings to existing OCLC records. Time required for this task will range from one to three minutes per record depending upon both local conditions and OCLC system response time. In addition to salaries for local staff, there will be a 60¢ per record charge by OCLC for retrospective conversion during prime Eastern time between 9:00 a.m. and 4:00 p.m., or 5¢ per record during non-prime time.

(5) There are two options for bringing external bibliographic records onto the computer system(s) for the Regions and building the recommended MARC data base in-house:

(5.1) Query OCLC online for wanted records, "capture" displays of records on special data recording devices, and process such records into the Regions' system(s) for further processing there or by one of the processes enumerated above.

(5.2) Obtain a magnetic tape of an existing data base from a large library, a network, or a commercial vendor and mount that data base on the Regions' system(s). Beginning with the largest library collection and continuing through all participating libraries, match shelflists against the imported data base and post holdings to appropriate records. When completed, strip out unused records from the imported data base. This model is recommended and estimated in Section 4.3.

4.1.1 DATA BASE COMPREHENSIVENESS AND QUALITY

The various alternatives outlined above can be applied variously and in combination to:

- ° Retrospective conversion for items included in the libraries' OCLC archival records;
- ° Retrospective conversion for items not included in the libraries' OCLC archival records; and
- ° Prospective conversion of records for new items that are either found or not found in OCLC.

The alternatives have different implications for the cost and quality of the resulting bibliographic data base.

4.1.2 NEEDED INFORMATION

In order to estimate costs of retrospective data conversion required to establish the recommended bibliographic data base, the following information should be obtained:

(1) If and when libraries with OCLC archival records will join in use of the system;

(2) If, when, and at what cost the selected system vendor could provide software capabilities for merging libraries' OCLC archival records with an imported bibliographic data base, identify and weed unwanted duplicates, provide Authority Control for name and subject headings, and so on.

(3) If, when, and at what cost Boston Public Library's data base could be made available to the Regions for installation on the Regions' system, and projections on the expected overlap of the Regions' holdings with those of the BPL data base.

4.2 Libraries' Estimates for Worst-Case Costs for Retrospective Bibliographic Data Conversion

This section presents worst-case estimates of the costs for retrospective bibliographic data conversion by the initially participating libraries. It was assumed that each library would input full bibliographic records via CRT/keyboard terminals connected online to the Regions' automated system(s).

During the cost study conducted by RMG Consultants with representatives of these libraries, estimates were made for each library's keyboard entry of its bibliographic records (see Section 10). Each library determined the number of retrospective bibliographic records that it would convert (among the kinds of records not included in conversion plans are those for materials to be weeded from collections), the minutes per record for input, and the wages for data conversion staff.

The resulting calculations show that the Central Regions initially participating libraries would expect to convert 571,000 bibliographic records at a labor cost of $199,000 to $219,000; and that the Western Region's libraries would convert 465,000 bibliographic records at a labor cost of $211,000 to $218,000. In sum, the two Regions' initially participating libraries would convert 1,036,000 bibliographic records at a cost for labor of $410,000 to $437,000.

This approach to retrospective bibliographic data conversion and these costs should be compared to those for the recommended model for bibliographic data conversion that is presented in Section 4.3.

4.3 A Recommended Model for Retrospective Bibliographic Data Conversion

This section presents a recommended model for estimating the costs of bibliographic data conversion for initially participating libraries in both Regions. The model is based upon the Regions' obtaining a large, high-quality data base (e.g., a copy of the MARC data base) and installing it upon their automated system(s). The six steps outlined below describe the conversion process. No costs have been estimated for obtaining the external data base.

(1) Obtain external data bases (e.g., OCLC archival records, the Boston Public Library data base). and load them into the Regions' computer system(s). Cost not estimated.

(2) Search the shelflist of the largest participant (Springfield - 731,500 volumes) against the imported data base.
Post Springfield's holdings to the imported data base for items found.
_____ titles x 2 minutes per search and posting x
$____ per minute of labor =

(3) Enter brief bibliographic records plus holdings for Springfield's titles not found in the imported data base.
_____ titles x 3-5 minutes per record input x
$____ per minute of labor =

(4) Search the shelflist of the second largest participant (Worcester - 720,000 volumes) against the shared data base.
Post holdings for items found.
_____ titles x 1-3 minutes per search and posting
x $____ per minute of labor =

(5) Enter brief bibliographic records plus holdings for Worcester's titles not found in the shared data base.
_____ titles x 2-4 minutes per record input x
$____ per minute of labor =

(6) Repeat Steps 4 and 5 for all other participants, either sequentially or simultaneously, depending upon system load capabilities and local conditions.

Labor costs will vary among the libraries and must be calculated separately for each using the formulas provided.

Tables 4.3-1 through 4.3-6 estimate the costs for retrospective bibliographic data conversion by applying this model to various sets of initially participating libraries in the Central and Western Regions. On the basis of costs for bibliographic data conversion (see Line 3, Table 2.3-1) it is recommended that the Regions share a single system and take the data conversion approach described in Table 4.3-1.

TABLE 4.3-1

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION COSTS FOR INITIAL LIBRARIES - BOTH REGIONS - TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 1,771,000 shelflist entries(1) for matches against imported data base at 1/2 minute each (1,771,000 x 1/2 min. ÷ 60 = 14,758 hours) and at labor cost of $4.50 per hour (14,758 hours) x $4.50 = $66,411 (2).	$ 66,411
2. POST holdings to shared data base (2) for 1,648,000 searches(3) at 1.5 minutes each (1,648,000 x 1.5 min. ÷ 60 = 41,200 hours) and at labor cost of $4.50 per hour (41,200 hours x $4.50 = $185,400).	185,400
3A ENTER brief bibliographic records and POST holdings for 123,000 records (3) at 3 minutes each (123,000 x 3 min. ÷ 60 = 6,150 hours) and at labor cost of $4.50 per hour (6,150 x $4.50 = $27,675).	27,675
3B ENTER full bibliographic records and POST holdings for 123,000 records(3) at 5 minutes each (123,000 x 5 min. ÷ 60 = 10,250 hours) and at labor cost of $4.50 per hour (10,250 x $4.50 = $46,125).	46,125
4. TOTAL (Lines 1, 2 and 3A -- brief records)	$279,486
5. TOTAL (Lines, 1, 2, and 3B -- full records)	$297,936

---

(1) Title to volume ratio of the aggregate 2,952,223 holdings for the initial libraries in both Regions is estimated at 3:5, or 60% of 2,952,223 which is 1,771,000, rounded.

(2) No price has been estimated for obtaining an external data base.

(3) Unique titles for the initially participating libraries are estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 6 volumes (2,952,223 ÷ 6 = 492,037). Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared data base (492,037 ÷ 4 = 123,000, rounded). Subtracting the 123,000 which will require bibliographic data input, there remain 1,648,000 titles (including duplicates among the libraries) for which holdings will be POSTED to the shared bibliographic data base.

TABLE 4.3-2

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION COSTS FOR INITIAL LIBRARIES - CENTRAL REGION - TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 756,600 shelflist entries(1) for matches against imported data base at 1/2 minute each (756,600 x 1/2 min. ÷ 60 = 6,305 hours) and at labor cost of $4.50 per hour (6,305 hours x $4.50 = $28,373)	$ 28,373
2. POST holdings to shared data base for 651,517 searches(2) at 1.5 minutes each (651,517 x 1.5 min. ÷ 60 = 16,288 hours) and at labor cost of $4.50 per hour (16,288 hours x $4.50 = $73,296)	73,296
3. ENTER full bibliographic records and POST holdings for 105,083 records (2) at 5 minutes each (105,083 x 5 min. ÷ 60 = 8,757 hours) and at labor cost of $4.50 per hour (8,757 x $4.50 = $39,407)	39,407
4. TOTAL	$141,076

---

(1) Title to volume ratio of the aggregate 1,261,000 holdings for the initial libraries in the Central Region is estimated at 3:5, or 60% of 1,261,000 which is 756,600.

(2) Unique titles for the initially participating libraries are estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 3 volumes (1,261,000 ÷ 3 = 420,333). Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared data base (420,333 ÷ 4 = 105,083). Subtracting the 105,083 which will require bibliographic data input, from the 756,600 titles in aggregate, there remain 651,517 titles (including duplicates among libraries) for which holdings will be POSTED to the shared bibliographic data base.

TABLE 4.3-3

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION COSTS FOR INITIAL LIBRARIES - WESTERN REGION - TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 1,014,740 shelflist entries(1) for matches against imported data base at 1/2 minute each (1,014,740 x 1/2 min. ÷ 60 = 8,456 hours) and at labor cost of $4.50 per hour (8,456 hours x $4.50 = $38,052).	$ 38,052
2. POST holdings to shared data base for 873,808 searches(2) at 1.5 minutes each (873,808 x 1.5 min. ÷ 60 = 21,845 hours) and at labor cost of $4.50 per hour (21,845 hours x $4.50 = $98,303).	98,303
3. ENTER full bibliographic records and POST holdings for 140,936 records (2) at 5 minutes each (140,936 x 5 min. ÷ 60 = 11,745 hours) and at labor cost of $4.50 per hour (11,745 x $4.50 = $52,853).	52,853
4. TOTAL	$189,208

---

(1) Title to volume ratio of the aggregate 1,691,233 holdings for the initial libraries in the Western Region is estimated at 3:5, or 60% of 1,691,233 which is 1,014,740.

(2) Unique titles for the initially participating libraries are estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 3 volumes (1,691,233 ÷ 3 = 563,744). Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared data base (563,744 ÷ 4 = 140,936). Subtracting the 140,936 which will require bibliographic data input, from the 1,014,740 titles in aggregate, there remain 873,808 titles (including duplicates among libraries) for which holdings will be POSTED to the shared bibliographic data base.

TABLE 4.3-4

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION COSTS FOR INITIAL LIBRARIES - FITCHBURG CLUSTER - TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 266,500 shelflist entries(1) for matches against imported data base at 1/2 minute each (266,500 x 1/2 min. ÷ 60 = 2,221 hours) and at labor cost of $4.50 per hour (2,221 hours x $4.50 = $9,995.	$ 9,995
2. POST holdings to shared data base for 239,250 searches(2) at 1.5 minutes each (239,250 x 1.5 min. ÷ 60 = 5,981 hours) and at labor cost of $4.50 per hour (5,981 hours x $4.50 = $26,915).	26,915
3. ENTER full bibliographic records and POST holdings for 27,250 records (2) at 5 minutes each (27,250 x 5 min. ÷ 60 = 2,271 hours) and at labor cost of $4.50 per hour (2,271 x $4.50 = $10,220).	10,220
4. TOTAL	$ 47,130

---

(1) Initial participant libraries report estimates of titles which total 266,500 (see Requirements Report Table 1-7).

(2) Unique titles for the initially participating libraries are estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 3 volumes (327,000 ÷ 3 = 109,000). Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared data base (109,000 ÷ 4 = 27,250). Subtracting the 27,250 which will require bibliographic data input, from the 266,500 titles in aggregate, there remain 239,250 titles (including duplicates among libraries) for which holdings will be POSTED to the shared bibliographic data base.

TABLE 4.3-5

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION
COSTS FOR INITIAL LIBRARIES - SHREWSBURY CLUSTER -
TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 128,400 shelflist entries(1) for matches against imported data base at 1/2 minute each (128,400 x 1/2 min. ÷ 60 = 1,070 hours) and at labor cost of $4.50 per hour (1,070 hours x $4.50 = $4,815).	$ 4,815
2. POST holdings to shared data base for 110,567 searches(2) at 1.5 minutes each (110,567 x 1.5 min. ÷ 60 = 2,764 hours) and at labor cost of $4.50 per hour (2,764 x $4.50 = $12,438).	12,438
3. ENTER full bibliographic records and POST holdings for 17,833 records (2) at 5 minutes each (17,833 x 5 min. ÷ 60 = 1,486 hours) and at labor cost of $4.50 per hour (1,486 x $4.50 = $6,687).	6,687
4. TOTAL	$ 23,940

---

(1) Title to volume ratio of the aggregate 214,000 holdings for the initial libraries in the Shrewsbury Cluster is estimated at 3:5, or 60% of 214,000 which is 128,400.

(2) Unique titles for the initially participating libraries are estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 3 volumes (214,000 ÷ 3 = 71,333). Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared data base (71,333 ÷ 4 = 17,833). Subtracting the 110,567 which will require bibliographic data input, from the 128,400 titles in aggregate, there remain 17,833 titles (including duplicates among libraries) for which holdings will be POSTED to the shared bibliographic data base.

TABLE 4.3-6

RETROSPECTIVE BIBLIOGRAPHIC DATA CONVERSION COSTS FOR INITIAL LIBRARIES - WORCESTER CLUSTER - TOP DOWN, USING IMPORTED DATA BASE

Task	Estimated Cost
1. SEARCH 362,000 shelflist entries(1) for matches against imported data base at 1/2 minute each (362,000 x 1/2 min. ÷ 60 = 3,017 hours) and at labor cost of $4.50 per hour (3,017 hours x $4.50 = 13,577).	$ 13,577
2. POST holdings to shared data base for 319,500 searches(2) at 1.5 minutes each (319,500 x 1.5 min. ÷ 60 = 7,988 hours) and at labor cost of $4.50 per hour (7,988 x $4.50 = $35,946).	35,946
3. ENTER full bibliographic records and POST holdings for 42,500 records (2) at 5 minutes each (42,500 x 5 min. ÷ 60 = 3,542 hours) and at labor cost of $4.50 per hour (3,542 x $4.50 = $15,939).	15,939
4. TOTAL	$ 65,462

---

(1) Title to volume ratio of the aggregate 720,000 holdings for the initial libraries in the Worcester Cluster is estimated at 3:5, or 60% of 720,000 which is 432,000. The Worcester Cluster has 70,000 OCLC records which are deducted, leaving 362,000 shelflist entries to be converted.

(2) Unique titles for the Worcester library is estimated in a vendor's Response to RMG Consultant's Request for Information at one for every 3 volumes (720,000 ÷ 3 = 240,000). From this, 70,000 OCLC records are deducted, leaving 170,000 unique titles to be matched against the data base. Of these, for estimating purposes, RMG Consultants calculates that 25% will not be matched in the external data base and will require input to the shared date base (170,000 ÷ 4 = 42,500). Subtracting the 42,500 which will require bibliographic data input, from the 362,000 titles in aggregate, there remain 319,500 titles (including duplicates among libraries) for which holdings will be POSTED to the shared bibliographic data base.

4.4 Comments on Prospective Bibliographic Data Conversion and Bibliographic Quality

The problem to be solved is how to establish new, non-duplicated records in the shared Bibliographic Data Base System, and how to upgrade the new records as additional information becomes available in the course of ordering, receiving, cataloging, and processing activities. The goal is high-quality, MARC-formatted records for the shared data base.

One possible model is to have each library search the shared Bibliographic Data Base System when executing an order, a bibliographic record conversion, etc. If a matching record were found, the library would add its own local data to the record. If no record were found, a library could then create a new record for the shared system either by inputting a brief record, inputting its fully cataloged record, or by transferring into the shared system the data obtained from an online search of the OCLC data base. In the first case where a preliminary version of a record was created (e.g., local input of a brief record for the purpose of ordering), the libraries must have an agreement about how such records will be upgraded and made final. In establishing procedures to upgrade records, the problem to be avoided is loss of the original and subsequent versions of a record which could make it difficult or impossible for a library to find its original processing record. This problem must be addressed by the vendor's design for the Acquisitions System, by established policies and practices among the participating libraries, or both.

Similarly, the participating libraries will need to establish policies, conventions, and practices to control the quality of new sets of retrospective records input to the shared data base by newly joining libraries. There should be an Authority Control System for the multiple-library data base, but it may be several years before very good capabilities of this nature are available in vended mini-computer systems. For the foreseeable future, it seems that the libraries will have to rely primarily upon the administrative agreements, policies, and practices for the control of quality of the shared data base, rather than upon technical solutions such as an Authority Control System.

5 PIECE CONVERSION AND PIECE DATA CONVERSION

This section presents and discusses alternatives for application of machine-readable labels to pieces in the libraries' collections (called "piece conversion") and for input/update of bibliographic records with the piece numbers appearing on machine-readable labels (called "piece data conversion").

5.1 The range of alternatives for obtaining piece labels and applying them to materials include the following general approaches.

(1) Establish a bibliographic data base for a library's collection -- without holdings data or unique call numbers for individual pieces -- using alternatives presented in Section 4. Apply labels randomly to pieces and update data base records with the call numbers and piece label numbers of items to which labels were applied.

(2) Establish a bibliographic data base for a library's collection -- with records that include holdings data and unique call numbers for individual pieces -- and automatically assign piece label numbers to call numbers in each record. From this data base produce a magnetic tape containing call number/piece label number pairs, in order by call number. From this tape have labels produced that contain piece label numbers and call numbers, with the labels arranged in call number order. Take these labels to the bookshelves and apply them to pieces with corresponding call numbers. Search for any pieces not found. This approach is very much like taking an inventory, and cost estimates for that process should be applicable.

(3) Randomly apply labels to pieces and input records to the system that contain for each piece its label number, call number, and other descriptive data such as a short author-title entry taken from the title page or the book card.

5.2 Recommendations and Comments on Piece Conversion and Piece Data Conversion

The "nicest" solution for piece conversion is to establish a data base following alternative (1) or (2) described in Section 5.1. Because piece conversion is related so thoroughly to retrospective bibliographic data conversion, it is recommended that the Regions defer final decisions about both these conversion processes until a vendor has been selected and related services from that vendor can be negotiated.

The objectives of piece conversion and piece data conversion should be to minimize one-time staff labor costs for:

- ° Inputs/updates to the data base for piece data conversion, at a cost of perhaps 1 to 1-1/2 minutes per input/update; and
- ° Handling of pieces in order to label them, at a cost of perhaps 1/2 to 1 minute per piece, depending upon the approach being followed and whether or not an input function (i.e., piece data conversion) is part of piece conversion.

The goal of conversion with respect to system start-up should be to establish enough records and labeled pieces to allow operations to begin. A reasonable goal for piece conversion might be to ensure that 50 percent of all pieces presented for charge-out have labels.

5.3 Labels and Label Sets

The following are recommended for the libraries' use of the proposed system:

- Piece labels whose piece label numbers are encoded with CODABAR bar-code and which also appear in OCR characters that are both human-readable and machine-readable (see Section 6.1).
- Piece label numbers whose values are numeric and check-digited, and which are coded to indicate which library owns a given piece.
- That two identical labels be applied to each book: one on the inside of the back cover, and one on the outside of the cover. The outer label is intended for possible use with fixed position laser scanners that read bar-code.
- That "label sets" for a given library contain either two or three labels per set, depending upon the piece conversion and piece data conversion processes to be followed. This can be determined once these processes have been decided.
- That the labels used be produced through a photographic process, and not through an impact printing process, in order to provide durable, high-quality labels of good resolution and with low probabilities for ink smear.
- That "outer labels" on books be coated with Mylar or covered with Mylar "overlabels" to protect the outer label and, in the case of the overlabel, to attach the outer label more securely.

6 CONVERSION OF PATRON ID CARDS AND DATA

This section explains and makes recommendations for libraries' conversion of patron records to machine-readable form and issuance to patrons of machine-readable ID cards.

6.1 Provision of Patron ID Cards

This section makes recommendations on provision of machine-readable patron ID cards for each of the Regions' libraries.

It is recommended that ID cards contain labels whose patron ID numbers are encoded with CODABAR bar-code and which also appear in OCR characters that are both human-readable and machine-readable (see Section 5.3).

It is recommended that such ID cards be laminated, and that the labels be beneath the laminate in order to protect them from all of the wear factors to which ID cards are normally subjected: surface wear, abrasion, scraping, etc.

It is further recommended that insofar as practical these ID cards be regarded as permanent ID cards, in order to amortize their costs.

It is recommended that Patron ID Numbers be all-numeric and check-digited.

6.2 Conversion of Patron Records

The simplest models for this are (1) to load available machine-readable files of patron data into the Regions' system(s), and (2) to have each library input its patron records into the system. None of the Regions' public libraries has a machine-readable patron data base; some of the academic libraries in the Regions do. Should academic libraries wish to join in use of the system(s), the Regions should investigate the loading of machine-readable patron files with the system vendor.

7 SYSTEM PROCUREMENT

This section addresses the objectives and processes for procurement of systems for the Regions.

7.1 Objectives for System Procurement

(1) To share the costs among the two Regions of a consultant for the procurement process.

(2) To gain as complete and accurate data as possible on the one-time and ongoing costs of systems (i.e., to improve the estimates presented in this plan via the process of evaluating and negotiating proposals and investigating problems through dialogue with vendors).

(3) To make a final decision on whether to have a single system or two systems initially.

(4) To establish the best possible bargaining position by having both Regions working together in the procurement process.

(5) If separate systems are acquired for each Region, to obtain them from a single vendor in order to gain the most favorable terms and conditions for purchase and for any special services (e.g., relating to data conversion) that might be required.

7.2 The Process of System Procurement

The purpose of this section is to consider the process of procuring systems for the Regions' uses.

RMG Consultants recommends a process of the following nature by which the Regions would proceed together to procure either one system for shared use by both Regions or a separate, single system for each Region.

- ° Regions retain a consultant for the procurement process.
- ° Regions meet with consultant to review current situation and answer questions about rules, regulations, and other constraints for the procurement process: e.g.,
  - which libraries are ready to participate.
  - which organization will issue the request-for-proposals.
- ° Consultant makes final updates to Requirements Report for Automated Library Systems for Automated Library Systems for the Central-Western Massachusetts Regional Library System (e.g., concerning capacity requirements for initial libraries) and to Request for Proposals for Automated Systems for the Central and Western Massachusetts Regional Library Systems (e.g., concerning duties and issuing organization).

- Regions issue Request for Proposals.
- Regions receive proposals from vendors.
- Regions and Consultant read proposals.
- Consultant meets with Regions to review proposals:
  - with Joint Evaluation Task Force.
  - With each Region's Automation Committee.
  - Plan further data gathering from vendors and libraries by sub-committees.
- Regions' subcommittees gather further data.
- Consultant gathers further data from vendors and performs analysis.
- Consultant meets with Regions to continue evaluation process.
- Regions invite selected vendor(s) to make presentations and to enter preliminary negotiations.
- Regions and consultant receive vendor presentations and enter negotations.
- Regions and consultant gather further data and perform further analyses.
- Regions and consultant meet with vendor of choice to make final plans and complete negotiations.

- Vendor submits final contract.
- Consultant and Regions review and revise contract.
- Regions and vendor conclude contract.
- Regions update plan for system implementation.
- Regions organize and staff for system implementation.

8 GOVERNANCE OF THE AUTOMATED SYSTEM(S)

A governing structure will need to be established for the automated library system(s) to be shared by the two Regions; if there are individual systems for each Region, two governing structures should be created. The governing structure recommended below can be applied to a single Region or to both Regions together, as needed.

It is recommended that the central site equipment for the automated library system and the computer programs of the system be owned and administered by one of the Regions. Equipment installed in the individual libraries may be either owned by the local libraries or leased from the Region if the Region is able to accumulate the capital necessary to provide for this arrangement.

Libraries participating in the automated system should have an advisory function to the administrator of the system. An Advisory Committee composed of the directors, or their representatives, for each of the participating libraries should be established for the purpose of reviewing the operation of the system and the effectiveness with which the needs of the member libraries are being met.

Agreements should be executed with each public, academic, or special library which chooses to participate in the joint library automation system. The agreement should delineate the services to be provided and the costs and other terms associated with those services.

Questions related to planning for system growth, either in terms of functions or number of libraries in the system, will have an impact on libraries throughout the Regions. Planning should be done in a forum which hears and addresses the needs of all the communities. It is therefore recommended that the Central Regional Advisory Council and the Western Regional Advisory Council be assigned appropriate planning responsibilities.

9 SYSTEM FINANCE

The financial plan for the acquisition and implementation of an automated library system may involve a variety of funding sources from local communities, the Regions, the State, and both public and private grants.

A participating library will be required to provide the terminals and associated equipment located in the community's library, as well as site preparation for the equipment. The local library will also pay telecommunications charges between the local library and the central computer site, although this charge will be pro-rated among all participants to eliminate a factor which could mitigate against participation by libraries at the greatest distance from the central computer site. Finally, the local library should expect to pay an annual maintenance charge for each terminal and associated piece of equipment on site.

The Regions should develop the financial plan to procure and install the central automated system, based on State, Federal, and private grants insofar as these are available. In addition, it may be necessary for the Regions to work with commercial banking and lending organizations to acquire the capital necessary to contract for installation of an automated system.

Conversion of the bibliographic records of the participating libraries should be undertaken as a coordinated project by the Regions. Elsewhere in this plan the methodology recommended for the most cost-effective performance of that work is described. Local libraries may be assessed a per title charge to enter their unique bibliographic records and to post holdings for their collection to the central data base. The Regions should assume the costs of acquiring and mounting a large, high-quality data base on the central computer system as a data source from which the local libraries can obtain high-quality, fully MARC compatible bibliographic records without the necessity of coding and keystroking the data for each record.

Local libraries should expect to bear the full cost of preparing the collection for circulation by applying machine-readable labels to all materials to be controlled and entering piece identification onto the bibliographic record in the central data base. Local libraries should also expect to undertake the conversion of patron records to machine-readable format and to apply machine-readable labels to each borrower's library card.

If possible, the Regions should exact a surcharge from libraries using the system, in order to capitalize replacement of the system. For example, it would be desirable for the Regions to accumulate resources to replace the central facility hardware and software in 5 to 7 years. Exactly how much this should cost, and how much such surcharges would need to be, should be investigated during the procurement process and included in the Regions' financial planning and addressed in agreements with participating libraries.

10 LIBRARIES' COST ESTIMATES

This section presents the findings of a cost study conducted by RMG Consultants with representatives of initially participating Central and Western Region libraries.

Library managers observed presentations by three vendors of automated circulation control systems at public meetings held in the Regions. Based on these presentations and on descriptive materials about the functional capabilities of such systems, the managers estimated the impact of automated systems upon circulation operations in their libraries.

The library managers calculated the personnel costs for conversion of bibliographic records and patron records to machine-readable form, and labelling of pieces in library collections with machine-readable labels. The numbers of bibliographic and patron records to be converted, pieces to be labelled, the unit time to perform each conversion, and the locally prevailing wage were provided by each library.

One-time start-up costs for supplies for piece and patron record conversion, numbers and types of terminals for the automated circulation control system, and physical preparation of the site were also calculated or estimated based on local conditions.

Finally, the ongoing costs of the present manual circulation control systems were estimated and probable future personnel costs of staffing an automated circulation control system were compared.

All estimates and calculations were performed by local library managers following a methodology developed and directed by RMG Consultants, Inc. The ten-page worksheets for each of the thirteen libraries are the source of cost data for local library conversion and ongoing personnel costs for circulation control which are used in Tables 10-1 through 10-5.

Table 10-1 shows that these 13 libraries could expect to pay $1.4 million to $1.6 million in one-time costs for purchase of terminals and other equipment in their libraries, for supplies (including machine-readable piece labels and patron ID cards), and for labor (special hires or reallocation of existing staff) for conversion to automated systems. The cost study assumed the worst-case methods and expenses for bibliographic data conversion, for contrast to the model presented in Section 4.3 of this plan. The libraries' estimates for bibliographic data conversion are considered in Section 4.2.

Table 10-1 also shows that, were the libraries to have automated systems installed into their current library operations, they could expect to displace $131 thousand of the costs they are experiencing annually.

TABLE 10-1
SUMMARY OF COST ESTIMATES BY INITIALLY PARTICIPATING LIBRARIES

	1	2 7 Central Region Libraries ($000)	3 6 Western Region Libraries ($000)	4 Total ($000)
1	One-Time Costs	665.3-734.8	745.6-837.4	1,410.9-1,572.2
2	Annual Cost Displaced	62.4	68.7	131.1

Notes for Table 10-1

(a) Line 1, Col. 2: Taken from the totals in Col. 6 of Table 10-2.

(b) Line 1, Col. 3: Taken from the totals in Col. 6 of Table 10-3.

(c) Line 1, Col. 4: Sum of Line 1, Cols. 2 and 3.

(d) Line 2, Col. 2: Taken from the totals in Col. 2 of Table 10-4.

(e) Line 2, Col. 3: Taken from the total in Col. 2 of Table 10-5.

(f) Line 2, Col. 4: Sum of Line 2, Cols. 2 and 3.

TABLE 10-2

CENTRAL REGION:
COSTS ESTIMATES FOR LABOR AND SUPPLIES TO CONVERT BIBLIOGRAPHIC, PIECE, AND PATRON FILES (IF EXECUTED SEPARATELY BY EACH LIBRARY) AND FOR ONE-TIME EQUIPMENT PURCHASES AND SITE PREPARATION

Library	1 Percent of Records to be Converted	2 Labor	3 Supplies	4 Equipment	5 Site Preparation	6 One-Time Costs
1	90	$155,423-168,235	$25,924- 32,709	$102,375		$283,092-303,319
2	75	72,211- 75,981	9,326- 12,572	26,400- 31,000	$2,000	109,937-121,553
3	100	58,517- 66,767	7,176- 9,229	18,400		84,093- 94,396
4	90	35,882	4,881	23,375		64,138
5	98	24,140- 32,649	2,324- 2,541	21,400		47,864- 56,590
6	100	24,955- 33,690	2,994- 3,724	10,650- 14,650		38,599- 52,064
7		19,518- 24,651	4,592	13,500		37,610- 42,743
TOTALS		$390,646-437,855	$56,587- 70,248	$216,100-224,700	$2,000	$665,333-734,803

Notes for Table 10-2

(a) Col. 1: Each library estimated the portion of its collection which it would be desirable to enter into the bibliographic database. Portions of collections not to be converted include records for titles the librarians expect to weed from the holdings.

(b) Col. 2: This column presents the total of three conversion costs which were estimated by library managers:

(1) Input full bibliographic records, locally, into a local machine file, into OCLC, or into another machine file;

(2) Label each physical unit (piece) with a machine-readable label, search the new machine-readable bibliographic file for the appropriate record, and input piece label number to the data base; and

(3) Prepare borrower identification and files by affixing a machine-readable label to each identification card, laminating the card, and entering registration records for borrowers and the label numbers into a machine-readable file.

(c) Col. 3: Supplies costs as estimated by library managers for piece labelling and borrower identification. Credits were deducted for the annual cost of supplies which the managers determined they would no longer have to purchase if an automated circulation system were installed.

(d) Col. 4: Library managers have estimated the number and type of computer terminals and related equipment which will be required to implement the automated circulation function. These estimates are not necessarily the same as estimates received in vendors' quotations (see Section 3 of this plan).

(e) Col. 5: Library managers provided estimated costs to install electrical circuits and outlets, to install communications lines, and to modify physical facilities or equipment, as required, for automated circulation control.

(f) Col. 6: The sum of Col. 2, 3, 4, and 5.

TABLE 10-3

WESTERN REGION:
COSTS ESTIMATES FOR LABOR AND SUPPLIES TO CONVERT BIBLIOGRAPHIC, PIECE, AND PATRON FILES (IF EXECUTED SEPARATELY BY EACH LIBRARY) AND FOR ONE-TIME EQUIPMENT PURCHASES AND SITE PREPARATION

Library	1 Percent of Records to be Converted	2 Labor	3 Supplies	4 Equipment	5 Site Preparation	6 Total One-Time Costs
1	85	$270,385-302,468	$14,962- 19,881	$137,050-175,100	$550-2,000	$422,947-499,449
2	90	69,596	5,282	58,500	1,000	134,378
3	85	36,608- 50,858	3,266	14,200		54,074- 68,324
4		36,298	3,087- 4,086	19,600	5,300	65,285
5		18,944	2,449	14,650	150	36,193
6	66	16,137	1,970	15,050	600	33,757
TOTALS		$447,968-494,301	$31,016- 36,934	$259,050-297,100	$7,600-9,050	$745,634-837,386

Notes for Table 10-3

(a) Col. 1: Each library estimated the portion of its collection which it would be desirable to enter into the bibliographic data base. Portions of collections not to be converted include records for titles the librarians expect to weed from the holdings.

(b) Col. 2: This column presents the total of three conversion costs which were estimated by library managers:

(1) Input full bibliographic records, locally, into a local machine file, into OCLC, or into another machine file;

(2) Label each physical unit (piece) with a machine-readable label, search the new machine-readable bibliographic file for the appropriate record, and input piece label number to the data base; and

(3) Prepare borrower identification and files by affixing a machine-readable label to each identification card, laminating the card, and entering registration records for borrowers and the label numbers into a machine-readable file.

(c) Col. 3: Supplies costs as estimated by library managers for piece labelling and borrower identification. Credits were deducted for the annual cost of supplies which the managers determined they would no longer have to purchase if an automated circulation system were installed.

(d) Col. 4: Library managers have estimated the number and type of computer terminals and related equipment which will be required to implement the automated circulation function. These estimates are not necessarily the same as estimates received in vendors' quotations (see Section 3 of this plan).

(e) Col. 5: Library managers provided estimated costs to install electrical circuits and outlets, to install communications lines, and to modify physical facilities or equipment, as required, for automated circulation control.

(f) Col. 6: The sum of Col. 2, 3, 4, and 5.

TABLE 10-4

CENTRAL REGION: LIBRARY MANAGERS' ESTIMATES OF CIRCULATION DEPARTMENT COSTS TO BE DISPLACED IN AN AUTOMATED SYSTEM

Library	1 Cost of Present Staffing	2 Estimated Costs Displaced	3 Percent Displaced	4 Estimated Cost of Future Staffing
1	$162,630	$48,789	30	$113,841
2				
3	40,000- 45,000	5,000	11.1-12.5	35,000- 40,000
4	31,808	4,544	14.3	27,264
5	23,814			
6	21,786	4,096	18.8	17,690
7	18,582			
TOTALS	$298,620-303,620	$62,429	20.6-20.9	$193,795-198,795

Notes for Table 10-4

(a) Col. 1: Library managers have identified costs to staff for circulation control in the manual systems presently in operation.

(b) Col. 2: Based on functions and capabilities of the automated circulation control systems demonstrated and described for the Region by vendors, library managers have determined staff functions which will change with automation and have calculated the consequent changes in operational costs for circulation control.

(c) Col. 3: Col. 2 as a percentage of Col. 1.

(d) Col. 4: Col. 1 less Col. 2.

TABLE 10-5

WESTERN REGION:
LIBRARY MANAGERS' ESTIMATES OF CIRCULATION DEPARTMENT COSTS TO BE DISPLACED IN AN AUTOMATED SYSTEM

Library	1 Cost of Present Staffing	2 Estimated Costs Displaced	3 Percent Displaced	4 Estimated Cost of Future Staffing
1		$2,790		
2	$51,174	39,934	78	$11,240
3				
4	31,000	11,500	37.1	19,500
5	19,830	14,477	73	5,353
6				
TOTALS	$102,004	$68,701	67.4	$36,093

Notes for Table 10-5

(a) Col. 1: Library managers have identified costs to staff for circulation control in the manual systems presently in operation.

(b) Col. 2: Based on functions and capabilities of the automated circulation control systems demonstrated and described for the Region by vendors, library managers have determined staff functions which will change with automation and have calculated the consequent changes in operational costs for circulation control.

(c) Col. 3: Col. 2 as a percentage of Col. 1.

(d) Col. 4: Col. 1 less Col. 2.

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